latter case. It is important to note in this connection that mass movement, or at any rate wind resultants, rather than relative frequency of different directions should be made the basis of a study of planetary circulation. Cloud observations in general give direction only and do not therefore give us conclusive results. Added to this is the impossibility, as already stated, of observing wind conditions in the higher strata when low clouds are present.— *W. R. Gregg.*

SUPERPOSITION OF AERIAL CURRENTS IN THE PENINSULA OF CAPE VERDE, SENEGAL.

By H. HUBERT.

[Comptes Rendus, 168, pp. 99-102, Jan. 13, 1919.]

In the interior of western Africa, the normal fall of air temperature with increase of altitude occurs, whether the surface wind is the monsoon or the harmattan, but on the Senegal coast this rule is nor followed when the trade wind blows. Observations made there in a hydroplane during October and November, 1918, show that temperature increases with height, either from ground level or from a height up to about 100 meters, until a maximum is reached between 500 and 600 meters, which may be as much as 6° C. above the temperature at ground level. As height still further increases the normal fall of temperature again sets in, so that ground temperatures are again met with at heights of 1,000 to 1,300 meters. Relative humidity near the ground is high, but falls rapidly at about 200 meters, and reaches a minimum where the temperature shows a maximum.

The observations are explained by the superposition in this season of the dry and hot harmattan east wind above the humid, cool, northerly trade-wind, the plane of contact being below 500 meters. It is always possible, however, for the harmattan to descend to the surface, and entirely displace the trade-wind in these months.—*Science Abstracts*, 3, 1919, p. 150.

ABSTRACTS, REVIEWS, AND NOTES.

AMERICAN METEOROLOGICAL SOCIETY.

An American meteorological society will probably be formally organized at St. Louis, December 29. (*Science*, Aug. 22, 1919.) Strange as it may seem, considering the fact that our national weather service was organized half a century ago, there has never been a national meterological society. According to a recent circular, the project is being received with considerable enthusiasm and several hundred people have indicated their desire to join. The objects stated are:

The advancement and diffusion of the knowledge of meteorology and climatology, and the broadening of their applications in public health, agriculture, engineering, aeronautics, industry, and commerce.

To accomplish these aims, membership in the society has been thrown open to all who may be interested; yet provisions planned for the election of eminent meterologists as fellows will insure its standing as a scientific society. Its membership field is the Western Hemisphere, and its hope is cooperation which will bring together the producer, the teacher, and the user of meterological knowledge. It is stated that no attempt will be made at the outset to launch a new meterological publication—only a monthly leaflet of news, notes, queries, etc., is contemplated.—*C. F. B.*

INTERDEPARTMENTAL BOARD ON METEOROLOGY.

The important benefits resulting from the application of meteorological principles in the direction and control of navigation of the air, as also major artillery and other military and naval operations, has led to certain kinds of meteorological work becoming a more or less permanent activity of the War and Navy Departments. This has resulted in numerous informal conferences between representatives of the Weather Bureau and the other departments, and the whole subject has finally been recognized as of such importance as to justify the organization of a more or less permanent interdepartmental board selected to discuss and consider the relative needs of the departments and the arrangement of cooperation and coordination of work to accomplish these results in the most economical and advantageous fashion and in a manner to avoid unnecessary duplication. The board was created by the Secretary of War, acting for and by direction of of the President, and is as follows:

I hereby appoint a board to consider the question of the collection and dissemination of meteorological data and to make recommendations:

Lieut. Col. Horace Hickam, Air Service.
Lieut. Col. W. R. Blair, Signal Corps.
Lieut. Tunis A. M. Craven, U. S. Navy.
Lieut. (junior grade) C. N. Keyser, U. S. Navy.
Prof. Charles F. Marvin, Chief of Weather Bureau.
Mr. R. H. Weightman, Meteorologist, Weather Bureau.

The order further designates Prof. Charles F. Marvin as chairman of the board and provides that meetings shall be held at the office of the Chief of the Weather Bureau and other places at such times as may be designated by the chairman.

But few meetings of the board have been held as yet, but it is obvious that an interdepartmental agency of this character provides for the most effective coordination and cooperation between the departments interested. It is probable, also, that other departments of the Government that are interested in flying, as the Post Office Department, for example, may be requested to designate representatives.

It is expected that important provisions will be made for the enlargement of the meteorological work of the Bureau in the interest of civil and military aeronautics.—*Weather Bureau Topics and Personnel, Sept., 1919.*

UNIFICATION OF THE BRITISH METEOROLOGICAL SERVICES.

By LIEUT. COL. E. GOLD.

[Extracts from Symons's Meteorological Magazine, September, 1919, pp. 86-88.]

A famous general of the Flying Corps once remarked that, whatever may have been his opinion about the policy of the allied supreme command, he was fully convinced that a single meteorological service was the correct policy for the Western Front. Full interallied meteorological unity was never indeed achieved but there was, in the field, a national unity in favorable contrast with the trinities in Paris and London; and there was the closest cooperation between the French, British, and American military meteorological services.

With the end of the war the movement for unity gained power, and now, at last, the British Isles have one meteorological service with an establishment or personnel and equipment more in accordance with the importance of the

science than the prewar establishment, which corsponded rather with the humility induced in its devotees by the study of meteorology.

This unification and expansion means for meteorologists increased opportunities and responsibilities; it does not mean a meteorological millenium in which all difficulties of administration vanish and the secrets of isobaric charts stand revealed.

* * * * *

By the amalgamation of the army, navy, and air force meteorological services with the parent meteorological office,[1] the new service will be able to combine the teachings of meteorological history with the endeavor to secure simplicity and definiteness in meteorological language, codes, and phenomena. But it will also have unparalleled opportunities for developing the three-dimensional study of the atmosphere.

* * * * *

Although there never were observation enough, yet there is always a danger of the meteorologist being swamped by the observations and records which pour in upon him; the danger is an increasing one as also is the tendency to regard observations as things of the moment to be thrown away or filed forever, immediately the forecaster has done with them. If the new service is successful in dealing with this problem its contribution to our knowledge of climate in and above the British Isles will be a more enduring monument than the apparently ephemeral achievement of an accurate forecast.

Finally, British meteorology is inseparable from the ocean; the pressing need for economizing our stores of accumulated energy make it desirable that the meteorology of the ocean should be put on a footing from which it can announce the energy practically available in the winds, the rate at which it can be supplied on any route, and the routes on which the maximum per mile can be attained. Warnings of gales, ice and fog, do not represent the only way in which the meteorology of the sea can contribute to the national welfare; but the effective use of the existing and increasing statistics of marine meteorology depends on a close liaison between the meteorologist, the shipping company, and the sailor. With a "meteorologist in every port" this ought now to be practicable.

BRITISH METEOROLOGICAL OFFICE STAFF.

Changes in the meteorological office staff have recently been made, and the following appointments have been announced: Mr. R. G. K. Lempfert becomes assistant director, and takes general oversight of observations and stations contributing observations to the office. Mr. Lempfert entered the meteorological office in 1902, and has been superintendent of the Forecast Division since 1910. Lieut. Col. E. Gold becomes assistant director, in charge of forecasting. Col. Gold graduated as third wrangler in 1902, and was elected fellow of St. John's College, Cambridge, in 1906; he was Schuster reader in dynamical meteorology from 1907 to 1910, and he then became superintendent of statistics at the meteorological office. On the formation of the meteorological section of the royal engineers in 1915 he was appointed to the command of the overseas contingent at general headquarters, France. Capt. D. Brunt is made superintendent of the work for army services. Capt. Brunt was in the meteorological section of the royal engineers during the war, ann acted under Col. Gold. Mr. Carle Salter becomes superintendent on the staff of the meteorological office for the British rainfall organization. Mr. Salter has recently been assistant director of the British rainfall organization, which has now come under the control of the meteorological office.—*Nature (London), Oct. 16, 1919.*

[1] It is announced by the Times that a scheme for the amalgamation of the existing Government meteorological services has been approved, and the details are being arranged. Under the stress of war conditions the meteorological office was supplemented by the addition of three specially organized services, respectively in charge of the Admiralty, the army, and the air ministry, and the coming of peace thus found four more or less overlapping departments. The present scheme brings them together under the directorship of Sir Napier Shaw, who has acted for some time past in the capacity of meteorological advisor to the Government. The new amalgamated service will meet the, requirements of the army, navy, royal air force, of civil aviation, fisheries, engineering, and of all others who require meteorological information. It will * * * bring together information from all parts of the world."—*Symons's Meteorological Mag. Aug., 1919, p. 80.*

THE METEOROLOGICAL RESOURCES OF THE EMPIRE.

[Abstract, presidential address Royal Meteorological Society, Jan. 16, 1918, by Maj. [now Col.] H. G. Lyons.[1]]

When we examine the meteorological organizations of the Empire, we may well be astonished at their extent and development, but as we look further into the matter we shall see that we are still far from utilizing them to the best advantage.

In all countries where there is a meteorological service the network of climatological stations is controlled by one or more first-order stations, or meteorological observatories, at which continuous records or hourly readings of pressure, temperature, wind, sunshine, rain, etc., are taken, but none as yet exists in the great colonial regions of East Africa, West Africa, or in the West Indian Islands, though there are 18 institutions of this class in other parts of the Empire.

The work of the meteorologist does not end with recording pressure, or the temperature, or the monthly amount of rainfall, but meteorological observations, after being taken, must be worked up into the various forms in which they will be most useful for shipping, agriculture, water supply, engineering, sanitation, and health, and now, also, aerial transport. The same form will not suffice for all, and meteorology itself has its own especial needs, but the important thing is that this information, however accurate and detailed it may be, will not be available in exactly the forms that answer to different requirements unless there is a sufficient staff of trained meteorologists to handle it and to supervise its preparation.

Nor is the study of a single region sufficient in itself. India, in preparing the monsoon forecast, draws upon data from Egypt, St. Helena, Brazil, etc. Egypt, in forming each year an estimate of the coming Nile flood, utilizes information from India, Uganda, the South Atlantic, and so on. The East Indian Islands need warnings of their hurricanes from the more eastward islands of their archipelago, and must utilize all that Asia and Africa can tell them about the development and movement of tropical storms before their precautions can be considered to have exhausted all the means available. All lands which lie near the subtropical zones of scanty rainfall are vitally interested in the problems of forecasting the probable sufficiency or failure of their rainy season. The droughts of the pastoral regions of Australia and South Africa are well known, and the same occur in the Sudan, though from its retarded development less has been heard of them up to the present time, but in the future, as the population increases and becomes more settled, the same considerations will demand attention. Similarly, the tem-

[1] Extracts from abstract in Nature (London), Jan. 24, 1918, vol. 100, pp. 416-417.